



Aquaculture
Stewardship
Council

Better Management Practices for Pangasius Aquaculture

*A tool to assist with compliance to the
Aquaculture Stewardship Council (ASC)
pangasius standards*

Version 1.0



PREFACE

The purpose of this document is to provide better management practices (BMP) to producers to aid in efforts to seek compliance to the Pangasius Aquaculture Dialogue (PAD) standards. It includes BMPs for all standards included in the PAD. Adherence to the BMPs in this document does not infer compliance with the PAD, rather these BMPs will assist in identifying means that a farmer can use to achieve the standards that are directly under the control of farm management. The BMP manual is to be used in conjunction with the PAD Standards Document and the PAD Auditor Guidance.

The PAD standards are global standards that will help minimize the key negative environmental and social impacts associated with tilapia aquaculture. They are performance-based standards that, with minor exceptions, are measurable. The standards will be amended periodically to reflect changes in science and technology, as well as to encourage innovation and continuous improvement.

These standards are the product of the PAD, a group of 600-plus people committed to transforming the pangasius aquaculture industry. The PAD included a broad and diverse group of stakeholders from around the world, among them representatives from the tilapia aquaculture industry, academia, environmental and social non-governmental organizations, and government. From September 2007 to August 2010, they worked together to identify the impacts the standards should address, then develop principles, criteria, indicators and standards that will help minimize those impacts. World Wildlife Fund (WWF) coordinated the process.

These are the first global standards for pangasius aquaculture developed through an open, transparent and multi-stakeholder process that is aligned with the International Social and Environmental Accreditation and Labeling Alliance's renowned guidelines for creating standards. The process was transparent, encouraged input from a diverse group of people, and ensured that their ideas were considered.

The final standards will be given to a new entity that will be responsible for working with independent, third party certification bodies to certify farms that are in compliance with the standards created through the PAD and other Aquaculture Dialogues established to develop global standards. The new entity, to be called the Aquaculture Stewardship Council (ASC), is expected to be operational in the middle of 2011.

This document was developed by the PAD coordinator and published by WWF.

PRINCIPLE 1. LOCATE AND OPERATE FARMS WITHIN ESTABLISHED LOCAL AND NATIONAL LEGAL FRAMEWORKS

Criteria 1.1:Local and national regulations.

Applicable Standards (1.1.1 – 1.1.4)

Justification:Local and national regulations shall be adhered to, as local regulations sometimes concern a different level of detail compared with national regulations. In cases of conflict between national and local regulations, national laws take precedence. As it is extremely difficult to audit for compliance to all laws in a country, PAD stakeholders decided the focus of the standards should be the four indicators included under this criteria.

Better Management Practices

1. Contact local regulatory bodies within the farm's legal boundaries to solicit information on what requirements are necessary within the local and national context.
2. Follow guidance provided by local regulatory body(s) on appropriate leases, deeds or permits required to legally establish and operate a tilapia aquaculture activity in this locale.
3. Follow guidance provided by local and national regulatory body(s) on appropriate leases, deeds or permits required to legally establish and operate a pangasius aquaculture activity your area. If the law limits the amount of biomass allowed to be cultured in certain areas, make sure you comply with those laws. Producers should have available, copies of valid permits, land deed titles, licenses, concessions, etc.
4. Tax payment confirmation certificates are often provided by the national and local authorities that collect these fees. Producers should identify these appropriate authorities and obtain written government confirmation that appropriate taxes have been paid.
5. If you have a pond, ask local authorities with competence on water quality if they can test water quality parameters to prove compliance with the existing water discharge regulation. If they can ask them to test the water you discharge and to issue you a statement that you comply with the regulation. If they cannot, ask your local authorities what are the ISO17025 accredited laboratories near your farm, contact an accredited laboratory and ask them to collected samples of the discharged water and to issue a statement about having collected the samples and on the test results.
6. Producers shall contact national authorities for any ambiguity or problems in understanding these laws.

PRINCIPLE 2: FARMS MUST BE LOCATED, DESIGNED, CONSTRUCTED AND MANAGED TO AVOID (OR, AT LEAST, MINIMIZE) THEIR NEGATIVE IMPACTS ON OTHER USERS AND THE ENVIRONMENT

Criteria 2.1: Meeting official development plans

Applicable Standards (2.1.1)

Justification: Although some countries may not have aquaculture development plans identifying approved aquaculture development areas, it is important, when these plans exist, to confirm that the unit of certification is within the identified zone. In areas where there is no official aquaculture development plan, the PAD assessment will serve as the appropriate intermediary tool.

Better Management Practices

1. Use global positioning system (GPS) to identify key, central points of farm location. A minimum of 4 GPS coordinates from the 4 corners of the farm shall be taken.
2. Contact local and national authorities to identify whether there are aquaculture development plans applicable to your farm
3. Find the location of your farm in the aquaculture plans and make sure you farm only in areas that are within the plans.
4. If you are sure that there are no aquaculture plans applicable to your farming area check regularly with the local and national authorities whether such plans have been developed.

Criteria 2.2: Conversion of natural ecosystems

Applicable Standards (2.2.1 – 2.2.4)

Justification: As pangasius farming is conducted in a relatively limited production area and farms are most commonly established by converting rice fields, certified PAD farms must be able to establish and expand into land that has been allocated for farming for the last 10 years without having to convert natural ecosystems (e.g. mangroves and wetlands). Establishment of the farm and expansion of an existing farm shall not result in conversion of wetlands and any other ecosystems other than agriculture or aquaculture land.

Farms established before the PAD standards were issued may have caused negative impacts on the environment or society. In addition, pangasius farms must use land and water, which, most likely, are associated with a certain degree of impact on the environment and other resource users. For these reasons, the PAD decided to establish a restoration fund to support activities aimed at compensating for such impacts. At the time of writing of these standards there was no restoration fund in place. However, it is expected that the Aquaculture Stewardship Council (ASC) will identify such a fund.

Discharge of earth during farm construction has been reported by some local communities as having affected their livelihood by negatively impacting water quality. Discharge of land in water bodies also affects the aquatic ecosystem. This practice should, therefore, be avoided.

An increasing number of species worldwide become endangered because of human activities. Pangasius farming should be conducted in a way that does not put further pressure on those species.

Better Management Practices

1. If any of the ponds in your farm were established after August 2010, contact the local authorities and ask them for a statement indicating that the land of your farm was agriculture or aquaculture land for 10 years or more. Alternatively you can use land use maps or statements that indicate that the land was agriculture or aquaculture land for at least the 10 years before.
2. Write and sign a letter stating that you commit to pay USD 0.50 for every ton of fish you want to get certified to an Environmental and Social restoration fund. Payment should be made for all crops harvested from the day of first certification. If the fund has not been established yet, you may not need to pay now, but you will have to pay the total amount (for every ton of ASC certified fish you produced) later.
3. If after August 2010 you remove any earth during farm construction or expansion or during operations, make sure you do not discharge any of this earth in common water bodies. In addition, keep records of where you moved the earth to.
4. In many locations where pangasius aquaculture takes place, rare and unique fauna exists. Many of the rarest of animals are in endangered or threatened categories. The International Union for the Conservation of Nature (IUCN) maintains a database, the Red

List, which identifies these species. In some cases, national authorities also have lists of endangered species. Under these standards, there is no tolerance for the killing or having any negative impacts of any species listed by IUCN in their Red List or by the national authorities as species to be protected. Farmers should pay special attention to their local fauna and the IUCN Red List, and implement precautionary measures to avoid any negative impacts on these types of species if they migrate through or inhabit surrounding areas of farms. Precautionary measures may include increased number of deterrent devices around enclosures; secondary impingement protection around water pumped or diverted from natural areas and increased human activity and monitoring. Instructions for using the IUCN Red List database follow:

Instructions:

- a. go to <http://www.iucnredlist.org/>
- b. follow to "other search options"
- c. select "Taxonomy"
- d. select "Animalia"
- e. indicate appropriate "Location", "Systems", "Habitat",
- f. click on "run search" and record species listed and whether they are threatened by the farming activity.

Secondary impingement protection when potential IUCN Red List species, categorized as vulnerable, endangered, critically endangered, extinct in the wild or extinct are known to be in region (including receiving and source waters) of farm

5. To find out if any of the species to be protected occur in your farming area, you shall submit the result of a search of literature either published in scientific journals (for which you may need assistance from a University near your area) or in local newspapers and magazines. Keep copies of all these documents to show what information you found
6. Keep detailed records of the procedures you use to handle endangered species in your farm to have no negative impact
7. You will also need to seek from local communities confirmation that no impact on endangered species was caused by the farm or your employees. Visit local communities and ask them to issue such statements, if true.

Criteria 2.3: Site connectivity

Applicable Standards (2.3.1 – 2.3.4)

Justification: Indicators 2.3.1–2.3.3 are meant to ensure that pangasius farms operate in a manner that allows boats and aquatic organisms to move (both horizontally and vertically) in what the PAD has coined a “reasonable space.” Reasonable space means the available space, where the siting of farms would not obstruct or cause major diversions for navigation. Reasonable space also applies to operational activities of farms (e.g., repairing activities). These should not impede boat and aquatic organism movement.

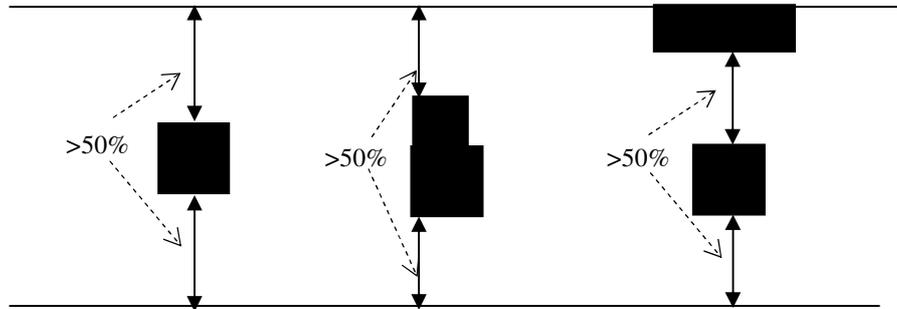
The PAD recognizes that the water bodies used for pangasius production are important, economically, for other types of industries that may use them for transport. A main driver for the standards in 2.3 is to minimize user conflicts. Standard 2.3.4 is meant to allow for organisms living on the banks to have a “reasonable” space available, in spite of the fact that pens obstruct complete access to the river bank where they are located.

Better Management Practices

1. Make sure that your farm does not block completely the movement of boats, aquatic animal or water in a water body or canal. If you do, remove those blockages to allow at least some movement.
2. Ask the local community to write and sign a statement testifying that their navigation has not being affected
3. If you have pens or cages, draw an outline of your farm, indicating location of the farms, cages in relation to the river or canal banks. Measure the size of each pen and cage and the distances between them and the river bank. Make sure that your farm complies with the diagrams in the next pages.
4. In any case, you can never have 3 or more pens, side by side

Diagram 1. Standard for cages. Minimum width of the water body without farms

Examples of acceptable cage distributions (black rectangles indicate farming units)



Examples of unacceptable cage distributions (black rectangles indicate farming units)

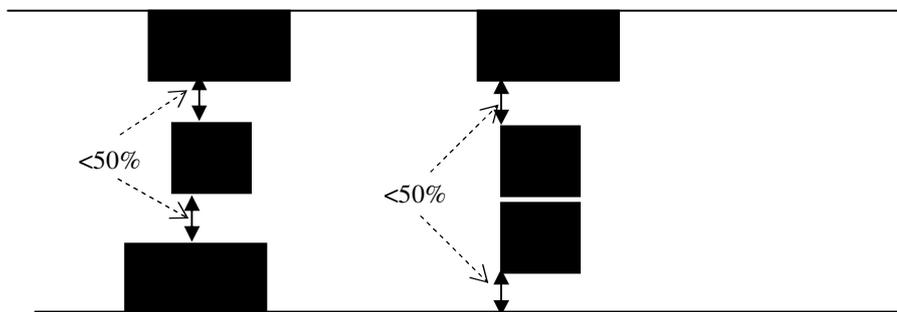
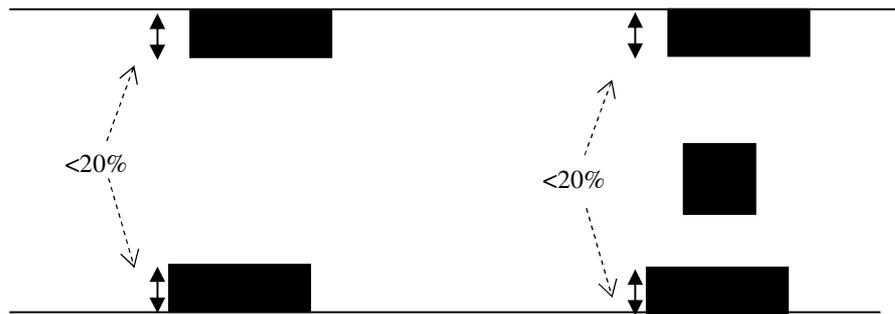


Diagram 2. Standard for pens. Maximum width a farm can occupy, calculated when the water body level/width is at its minimum

Examples of acceptable pen distributions (black rectangles indicate farming units)



Examples of unacceptable pen distributions (black rectangles indicate farming units)

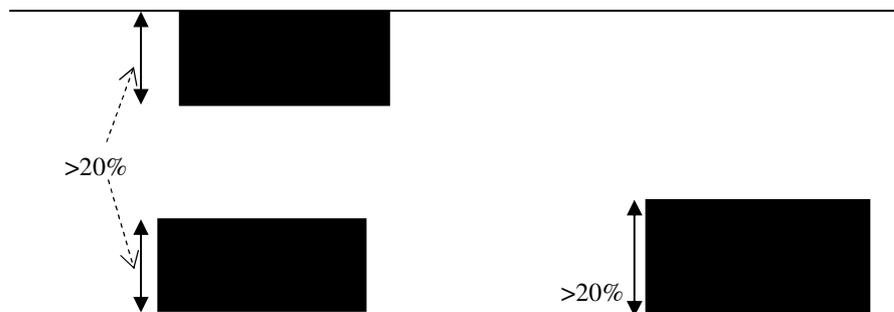


Diagram 3. Standard for pens. Number of contiguous pens allowed

Examples of acceptable pen distributions (black rectangles indicate farming units)



or



Examples of unacceptable pen distributions (black rectangles indicate farming units)



or



Criteria 2.4: Water use

Applicable Standards (2.4.1 – 2.4.2)

Justification: Water use is an increasingly important global issue and its efficient use is an important part of sustainable production. Pangasius production can require higher levels of water use compared to terrestrial animal food production. The PAD has included a water efficiency standard to encourage responsible water use. The 5,000 m³/metric ton of fish produced standard was set using actual data submitted by PAD stakeholders. It will serve as a starting place for the standards and be revised in future versions of the standards.

If the water allocation limits differ from the set 5,000 m³/metric ton of fish produced, then farmers must comply with both standards.

Better Management Practices

1. Throughout the production cycle you will have to measure and record the volume of water you took into your pond. To do that you will have to multiply the pond area (in square meters) by the height (in meters) of water you took into the pond. For example, if you have a pond that is 5000m² in area and you took 10 cm (which is equal to 0.1 meter), you took in 500m³ of water.
2. Keep receipts showing how many fish you harvested from each of your ponds
3. The total amount of water you take into your pond to grow pangasius should never exceed 5000m³ for every ton of pangasius you produce. This means that, if in the pond you produce 100t of pangasius, the total amount of water that you can take in is 500,000 m³.
4. Contact the local authorities and ask them if there is any limit to the amount of water that you can take into your farm. Ask the local authorities to give you written records showing the maximum amount, if any. Make sure you never exceed that amount.
5. If local authorities do not set a limit, look for an organization that can identify the maximum volume you can abstract for farming pangasius. Such an organization should have experience in setting such limits. This organization can be a government organization, a university, a private company or any other institution, provided they have experience. Make sure you never exceed the amount they state you can abstract.

PRINCIPLE 3: MINIMIZE THE NEGATIVE IMPACT OF PANGASIOUS FARMING ON WATER AND LAND RESOURCES

Criteria 3.1: Nutrient utilization efficiency

Applicable Standards (3.1.1 – 3.1.4)

Justification: Efficient use of nutrients in pangasius culture is key to better production in any type of system, as efficient nutrient utilization may result in less negative impacts on the receiving water bodies. There are several parameters that can be used to measure the impact of farm effluent on the water quality of a given water body (e.g., phosphorus, nitrogen, biological oxygen demand, chemical oxygen demand and suspended solids). However, members of the PAD agreed to prioritize the parameters that will be used in this standard and focus only on the most important nutrients: nitrogen and phosphorus. Both nitrogen and phosphorus are key nutrients that affect eutrophication, and both are released from the culture system through feeds and fertilizer.

The level and amount of phosphorus and nitrogen was set using data provided by producers who are directly and indirectly involved in the PAD process. The PAD agreed that the median of the available data was to be used instead of the mean. It should be noted that the value set in this standard is just the starting point and will be revised when relevant data becomes available.

Best estimates for Total Nitrogen (TN) and Total Phosphorus (TP) efficiency in cages and pens were taken from industry experts.

Better Management Practices

1. Keep detailed records of the type of feed you use (including lot number) and of the amount of feed you feed to the fish of every pond.
2. If you use commercial (pellet) feed, obtain from your feed manufacturer values of TP in every type of feed you use. The value of TN is the value of Crude Protein divided by 6.25. For example if you are feeding a feed with 30% Crude Protein, as $30/6.25$ is equal to 4.8, it means that your feed at a TN of 4.8%, which also means that you are adding 48g of TN for every kg of feed you use.
3. If you use home made feed, take sample of every type of feed you use and submit them regularly to a laboratory that can give you TP and TN results. Ask the laboratory if they are accredited ISO 17025. If they do, keep copies of their certification.
4. Keep the receipts showing how many fish you harvested for every pond, cage or pen.

For cages and pens

5. Make sure that the TP you feed never exceeds 20kg per ton of fish you produce
6. Make sure that the TN you feed never exceeds 70kg per ton of fish you produce

For ponds

7. Throughout the production cycle, keep detailed records of the amount of water you discharge. This can be calculated by multiplying the pond area (in m²) by the height (in meters) of the water you discharge.
8. Contact a laboratory that is ISO 17025 accredited to test TP and TN in water. Ask them to come to your farm and to collect the following samples

- a. Pond water:
 - i. In a pond that is in its second half of the production cycle
 - ii. At least 6h after the last water exchange
 - iii. In a randomly selected pond
 - iv. At a depth of 50% of the water column
 - b. Intake water:
 - i. At the time when you take water in.
9. Ask the laboratory staff to test both TN and TP in those water samples using the methodology stated in these standards (show them Annex D of the standards)
10. After you get the results apply the formulas below to calculate TN and TP discharged

TN Discharge (g/kg fish) =

$$\frac{[\text{Total TN (mg/l) in pond water} - \text{total TN (in mg/l) in intake water}] \times \text{Total discharged volume (m}^3\text{)}}{\text{fish yield (kg)}}$$

TP Discharge (g/kg fish) =

$$\frac{[\text{Total TP (mg/l) in pond water} - \text{total TP (in mg/l) in intake water}] \times \text{Total discharged volume (m}^3\text{)}}{\text{fish yield (kg)}}$$

11. Make sure the TN discharged per ton of fish you produce does not exceed 27.5kg/t. If it does, you cannot comply with these standards.
12. Make sure the TP discharged per ton of fish you produce does not exceed 7.2kg/t. If it does, you cannot comply with these standards.
13. If you cannot comply with the standards, you may consider doing one of the following:
 - a. Use a feed with lower amounts of TP or TN but that gives you the same FCR
 - b. Use a feed that gives you a lower FCR
 - c. Improve the survival of the pangasius, for example through better health management

Criteria 3.2: Measuring water quality in receiving water body

Applicable Standard (3.2.1)

Justification: Diurnal fluctuation is the only parameter that the PAD considered in determining the impact of farm effluent on the quality of the receiving water body. Fluctuation of the level of oxygen in a given water body is influenced by the rate of photosynthesis and respiration in the said environment. The rate of fluctuation in a given water body can be best observed by comparing early morning DO levels to those in the late afternoon, as during the early morning DO is usually low because of animal and plant respiration. Conversely, DO peaks in the late afternoon, having built up through photosynthetic activity that releases oxygen in the water during daylight hours. The percentage change in DO is a good indicator of the biological activity in the water. A lower value of percentage change of DO indicates a healthy water body. In order to minimize the contribution of aquaculture activities to eutrophication and to maintain the good quality of the natural water bodies, the PAD included a set level for diurnal change. Measurements for DO must be taken twice during the day, one sample 1h (\pm 30min) before sunrise and the second two hours (\pm 30min) before sunset in order to get the maximum and the minimum levels.

Exemptions to this standard were also identified and apply to farms that have “cleaner” water (i.e., where the value of the farm TP and TN is lower than that of the intake water), showing that the farm has an overall “cleaning” effect on water. This applies, regardless of whether the receiving water is eutrophic. Although this may not be common practice at the time when these standards were written, this exception has been included in the standards.

Better Management Practices

1. Every 2 weeks and for all the time you want to be certified, use a hand-held oxygen meter to measure dissolved oxygen, salinity and temperature in the water that receives the water you discharge from your farm. Make sure that such location is as close as possible to the point where you discharge the water, but not farther than 200m from the point of discharge
2. Each measurement should be taken 0.3m below the water surface
3. On the day you measure DO, take measurements for 2 times in 1 day. In order to get the maximum and the minimum levels measurements should be made:
 - a. 1h before sunrise (plus or minus 30 min) and
 - b. two hours before sunset (plus or minus 30 min)
4. Measure both the DO in mg/l and the DO at saturation (in %). If your instrument does not measure the DO saturation levels ask a technician to help you to calculate the DO saturation levels at your salinity, temperature and altitude using tables.
5. Make sure that all the equipment is calibrated at a frequency and by the method recommended by the manufacturer.
- 6.
7. Calculate the change in diurnal DO using the formula below

Percentage change in diurnal DO of receiving waters relative to DO at saturation =

$$= \left[\frac{\text{Max DO (mg/l)}}{\text{DO at saturationMax (mg/l)}} \times 100 \right] - \left[\frac{\text{Min DO (mg/l)}}{\text{DO at saturationMin (mg/l)}} \times 100 \right]$$

8. If the result of your calculation is higher than 65% then you are not in compliance to the standards. To be in compliance to the standards consider discussing with other farmers discharging water in the same water body on ways to reduce the amount of nutrients (such as Nitrogen or Phosphorus) discharged in the water.

Criteria 3.3: Measuring quality of pond effluents

Applicable Standards (3.3.1 – 3.3.3)

Justification: The PAD determined that monitoring the amount of nutrients being released to the water from a pond system is not enough to determine or control the amount of nutrients being released into the natural environment. Hence, monitoring of the quality of water being released from the pond system is also included in the standard.

The PAD determined key water parameters that need to be monitored in this standard. Percent change, not absolute value, will be set as the standard because the latter does not consider the quality of water that is coming into the aquaculture system.

Better Management Practices

For ponds only

1. Contact a laboratory that is ISO 17025 accredited to test TP and TN in water. Ask them to come to your farm and to collect the following samples.
 - a. Intake water (which could be the same sample as collected for 3.1 above)
 - b. Discharged water, which is the water you discharge from the pond
2. Make sure that these samples are collected from a pond which is randomly selected among the ponds that are in their 2nd half of the production cycle.
3. Ask the laboratory staff to test both TN and TP in those water samples using the methodology stated in these standards (show them Annex D of the standards)
4. After you get the results apply the formulas below to calculate the change in TN and TP

$\% \text{ Change} = (\text{value in outlet} - \text{value in the inlet}) / \text{value in the inlet}$

5. Make sure the % change in TP is not more than 100%. If it is, you cannot comply with these standards.
6. Make sure the % change in TN is not more than 70%. If it is, you cannot comply with these standards.
7. If you cannot comply with the standards, you may consider doing one of the following:
 - a. Use a feed with lower amounts of TP or TN but that gives you the same FCR
 - b. Use a feed that gives you a lower FCR
 - c. Treat the water before you discharge it
8. At least one time per week measure the DO in the water you discharge. DO can be measured using a hand-held DO meter.
9. Make sure the DO in the water you discharge is never lower than 3mg/l

Criteria 3.4: Sludge disposal for ponds and pens, not cages

Applicable Standards (3.4.1 – 3.4.2)

Justification: Waste management is closely related to water pollution issues. Sludge from ponds must be disposed of properly¹ and not discharged into public water bodies (i.e., places that are shared or belong to the government), given that sludge can be a significant pollution source.

Better Management Practices

1. Only discharge sludge in an area that belongs to your farm or to another farmer (with his authorization). You should have legal access to the area where you discharge the sludge
2. If the sludge is given (or sold) to somebody else, make sure you keep statements from that person indicating the volume of sludge received the time of delivery and their expected use
3. Describe clearly in a written document how you manage the sludge in your farm (for example how you collect it, how much for every time and what you do with it)
4. If you use a sludge repository apply the formula below and make sure that the size of the repository is at least the size calculated using the formula.

$$\text{Volume} = [\text{Area of ponds} \times 0.2\text{m}] - [\text{Area repository} \times 0.3\text{m}]$$

The area of ponds in the formula indicates the area of all the ponds you are collecting the sludge from to put it in the designated repository

Criteria 3.5: Waste management

Applicable Standards (3.5.1 – 3.5.4)

Justification: The construction and operation of pangasius farms involves the use of hazardous chemicals (e.g., combustibles, lubricants and fertilizers) and generates waste. The storage, handling and disposal of such hazardous materials and waste must be done responsibly, according to the law minimizing their respective potential impacts on the environment and human health. The PAD defines quantifiable indicators that imply the implementation of a management plan and the separation of waste, depending on their destination. The PAD determined that all hazardous materials and waste must be strictly controlled and that the proportion of recycled waste shall be improved over time, with an initial target of 50% of recyclable wastes. Another major waste stream is dead and moribund fish removed from ponds. Proper disposal (e.g., burial or incineration) is necessary to ensure that this waste does not impact the environment. In the case of mass mortalities associated, for example, with pesticide/chemical pollution of the intake water or abnormal water conditions (linked to abnormal weather incidences), the farm shall still adopt proper disposal of the dead fish.

Better Management Practices

1. Write in detail how you deal with or process any
 - a. solid wastes such as feed bags, empty containers, etc.
 - b. chemical/medicine waste
 - c. dead/moribund fish
2. Do not burn any waste from your farm
3. Do not discharge any solid wastes (e.g. bags, containers, etc.) in the natural environment surrounding the farm.
4. Make sure that any solid waste you may have in the farm does not have the potential of reaching the natural environment.
5. Do not discharge any human and animal solid wastes in the natural environment surrounding the farm.
6. Make sure that any human and animal waste you may have in the farm does not have the potential of reaching the natural environment
7. Build septic toilets to collect human waste
8. Bury pet feces
9. Do not discharge any chemical or medicine waste in natural environment surrounding the farm

10. Make sure that any chemical and medicine waste does not have the potential of reaching the natural environment
11. Make sure that all dead fish are processed through one of the following: incineration, burial, fermentation and use as fertilizer and production of fish meal or fish oil. Dead fish should never be used for human consumption. If there is strong evidence that the mortality was not caused by an infectious agent or a pesticide/chemical pollutant, the fish can be used as feed for animals other than pangasius. Evidence on the cause of mortality shall be provided by an aquatic animal health specialist (see Principle 6 for more information)

Criteria 3.6: Energy consumption

Applicable Standard (3.6.1)

Justification: Energy is consumed throughout the culturing, harvesting, processing and transportation stages of pangasius production. There are also many other energy drains to consider, such as energy consumed during the construction of facilities, while maintaining and updating facilities, during the production of those construction materials, and during the production of liming materials, fertilizers and other inputs. The PAD acknowledges that, at this time, there is insufficient data available for setting energy use standards. Therefore, the PAD standards require the collection of energy consumption data by audited farms in order to be able to set up energy standards in the future. To be useful for addressing the issue of carbon emissions in the future, data collection needs to be as exhaustive as possible so that the conversion of energy consumption to carbon emissions will be feasible.

All dead fish will lead to the production of greenhouse gases. Therefore, the amount of dead fish and the method adopted to dispose them shall be recorded and included in the computation of energy used.

Better Management Practices

1. Keep detailed records of the following:
 - a. All fuel (diesel or gasoline) you use in your farm
 - b. The amount of electricity you use in your farm
 - c. The amount of dead fish you have and how you disposed of them

PRINCIPLE 4: MINIMIZE IMPACTS OF PANGASIOUS AQUACULTURE ON THE GENETIC INTEGRITY OF LOCAL PANGASIOUS POPULATIONS

Criteria 4.1: Presence of pangasius in the water drainage system

Applicable Standards (4.1.1 – 4.1.3)

Justification: If pangasius farming occurs in locations where the farmed species is not indigenous or if a self-recruiting stock is not established, pangasius aquaculture can impact habitats and/or the genetic integrity of local pangasius populations. This type of aquaculture also can impact the environment if measures are not in place to minimize escapes from production systems, especially via drainage systems and during flood events. The PAD standards address this issue by ensuring that pangasius farming takes place only in locations where that species of pangasius is indigenous or has a self-recruiting stock established before January 2005. This date was set based on two pangasius generations (approximately three years each) in order to ensure that any farms which claim to be farming exotic species that are established can appropriately demonstrate via two generations of breeding that the species is indeed established.

The PAD recognizes that it may be possible to develop a technology to eliminate escapees. This will be considered in further revisions of the standards. Possible exceptions also will be considered.

Better Management Practices

1. Use a GPS to identify the location of your farm. Make sure you take at least 4 recordings (for the 4 corners of your farm)
2. Obtain a map of the river basin and indicate on it the location of the farm
3. If your farm is within the Mekong delta and you are farming *Pangasianodon hypophthalmus* or *Pangasius bocourti* then you are in compliance to the standards
4. If you are not farming within the Mekong delta region, ask FAO, IUCN or WWF if they can provide you evidence that the species of pangasius you are farming is indigenous of the river basin where your farm is located. Some of these information is also provided in their websites, hence if you know how to use internet you can look for this information yourself
5. If pangasius is indigenous you are in compliance to the standards
6. If the species of pangasius that you are farming is not indigenous contact local and national government offices to obtain, if available, an official national government statement that the pangasius species being cultured was established on or before 1 January 2005. This evidence should be based on multiple incidences of different age classes at different times and locations
7. If you cannot get such evidence from the authorities, ask a local university to help you search for evidence in international (peer-reviewed) papers. Again, such evidence should be based on multiple incidences of different age classes at different times and location indicate that the stock was self recruiting before 1st January 2005

8. If you can identify evidence that the species had a self-recruiting stock before the 1st January 2005, ask a local university to help you search for evidence in international (peer-reviewed) papers that the species of pangasius you are culturing does not have any negative impacts on the environment. If you cannot get such evidence you are not in compliance to these standards
9. If pangasius is neither indigenous nor has a self-recruiting stock established before the 1st January 2005, then the only way you can be certified is to demonstrate that pangasius cannot be established in the river basin. To do that, you will also need to ask the help to a university or other research organization to help you to search for scientific evidence.
10. Any evidence you collect should be based on actual field data and not on theoretical statement (for example “given the temperature of the water it is impossible for pangasius to get established”)

Criteria 4.2: Genetic diversity

Applicable Standard (4.2.1)

Justification: Genetic diversity is an important conservation issue, as escaped farmed pangasius have the potential to negatively impact the genetic diversity of wild pangasius by interbreeding. Genetic changes in captive bred or hatchery populations are likely in any stock of fish that is bred in captivity over several generations. Pangasius, in their natural habitat, have a complex population structure and there is evidence that different genetically distinct populations of pangasius species exist. Captive breeding may result in the mixing of genetically distinct stocks which may lower overall genetic diversity and reduce survival. Introducing a different strain of the same species (i.e., a population which is genetically different but still belonging to the same species) would therefore pose the risk of the different strain having an impact on the ecosystem when escaping, an impact that may not have been occurring with the original pangasius strain. The PAD standards address this issue by ensuring that seed used for juveniles is sourced from pangasius populations already established in the river system where the farming operation is located. Although this approach may represent a challenge for domestication programs, the PAD agreed to adopt a precautionary approach when dealing with introductions.

Better Management Practices

1. If the species of pangasius is either indigenous or has a self recruiting stock established before the 1st January 2005, you can only source seed from the populations in the river system where you are farming. You will therefore need to obtain statements from the hatchery and nursery where you buy the seed indicating the broodstock source and demonstrating that you are in compliance to the standards
2. If you cannot get such statements, then you need to find a pangasius seed supplier capable and willing to provide such statement, otherwise you will not be in compliance with the standards

Criteria 4.3: Source of seed

Applicable Standard (4.3.1)

Justification: There is concern that the use of wild-caught seed or wild collections of juveniles can lead to adverse impacts (e.g., decline) on wild pangasius populations as has occurred for other types of aquaculture (e.g., shrimp).

In addition, techniques used for catching wild seed are most often poorly selective, hence leading to high amounts of non-target species bycatch, impacting broadly on the aquatic biodiversity. Therefore, only hatchery seed should be used.

Better Management Practices

1. Never use wild pangasius seed
2. For all stocking events obtain a statement from the hatchery and/or nursery stating that the seed is generated from broodstock held in captivity

Criteria 4.4: Genetically engineered and hybridized strains

Applicable Standard (4.4.1)

Justification: The potential for enhanced strains of pangasius to out-compete native fish species causing genetic pollution provides sufficient justification to exclude any breeding manipulation (transgenic or hybridization) of culture species within the PAD standard. Thus, transgenic and hybridized strains are prohibited from being reared under these standards.

The use of GMOs and hybrid seed creates additional issues regarding genetic pollution and impacts on farm stocks and wild populations. These impacts can be prevented by avoiding the use of GMOs and hybrid seed which is mandated by the PAD standards.

Better Management Practices

1. Never use pangasius seed which is either a hybrid or genetically modified
2. For all stocking events obtain a statement from the hatchery and/or nursery stating that the seed is not transgenic or hybrid

Criteria 4.5: Escapees

Applicable Standard (4.5.1 – 4.5.4)

Justification: Genetic changes in hatchery populations also are an important aspect of pangasius aquaculture and the risks associated with it must be acknowledged. Some genetic changes are likely in any stock of fish that is bred in captivity over several generations. Therefore, minimizing escapes of captive-bred fish is essential to preventing the genetic disturbance of wild populations.

Pangasius escapees may also have an effect on local non-cattfish biodiversity through such things as competition and habitat destruction. Little data or information on this issue was located for the PAD, making it challenging to develop metrics. As this standard evolves, it is critical to assess these impacts and, where necessary, incorporate indicators and standards that measure and prevent any adverse impacts. This will be done in future versions of the standards.

While a range of techniques and practices are available to prevent escapes, no foolproof system has been developed. Therefore, it is important to approach escapee management from the perspective of minimization rather than hypothetical elimination. Escape reduction also is a good business practice, as there are economic incentives to prevent escapes. The PAD standards mandate a series of BMPs to try to prevent escapes and ensure compliance.

Better Management Practices

1. Take samples of fish at least weekly and records the size of the fish you sample
2. Record the size and kind of net mesh or grids you use to avoid escapees during water exchange
3. Inspect the mesh or grids every day to identify if there are any damages
4. Any time you see that the net or grid is damaged repair them
5. Remember to keep records of each daily inspection, the result of the inspection and, if you see any damages, how you repaired them
6. Contact local and/or national authorities and obtain official records showing the maximum water level in the previous 10 years
7. Obtain from local/national authorities a statement reporting the altitude of the dike in its lower point and the location of the point measured on a sketch of the farm. If the pond dike in any point is lower than the maximum water level in the previous 10 years, make sure you increase the height of the pond dike
8. Put trapping devices in drainage canals or water outlets
9. Check those devices (daily if possible) and keep records of the number of pangasius fish you find in them

10. If you find any pangasius fish, check where they may have been coming from and record any action you take in response to identifying pangasius in the traps (for example: checked more thoroughly the nets; repaired a small hole that could not be seen before...)

Criteria 4.6: Pond maintenance as part of escapee management

Applicable Standard (4.6.1 – 4.6.2)

Justification: As noted above, escapees from pangasius culture facilities can pose a conservation risk. While farmers can have measures in place to reduce escapees (i.e., criteria 4.5), occasionally major or catastrophic releases of farmed populations can occur if the pond dyke collapses, if the pond gets flooded, or if the farmer intentionally decides to release the stock to prepare the pond. These releases of farmed populations may have huge impacts on the environment (both pangasius and non-pangasius populations). Therefore, they are unacceptable under these standards.

The rationale to have two separate, but slightly different, escapes criteria is that a farmer may be in full compliance with criteria 4.5 but then could have a disease outbreak and release the whole farmed stock. The farmer also may not have appropriately (during design/construction) built a strong dike. Hence, although the bund is high enough, it may collapse, thereby releasing many farmed pangasius. The PAD does not want farms certified in these instances.

Better Management Practices

1. Never allow for the dike to collapse during culture, as if the dike collapse you will not be certifiable any more
2. Never release cultured fish in the wild, not even if the stock is performing poorly or if only few fish are left because of mortality.

PRINCIPLE 5: USE FEED AND FEEDING PRACTICES THAT ENSURE THAT FEED INPUTS ARE SUSTAINABLE AND MINIMIZED

Criteria 5.1: Sustainability of feed ingredients

Applicable Standards (5.1.1 – 5.1.7)

Justification: There are concerns over the potential impact on marine biodiversity of sourcing fishmeal and fish oil as feed ingredients from wild fish stocks and the efficiency of its conversion to farmed fish through feed. Although the amount of fishmeal and oil used in feeds for pangasius is much less than in farmed shrimp or salmon, these standards will, over time, ensure the efficiency of this conversion. The standards also will ensure that the sources of these ingredients are managed properly, in order to avoid excessively negative impacts on their source populations and ecosystems. Where feeds are produced on farm, the farm will be required to demonstrate its compliance with the ingredient-sourcing requirements and standards for feed. Where farms rely on commercial feeds, the standards will require documented information from the feed supplier(s) to allow them to demonstrate that they meet the standards.

Standard 5.1.1 prohibits the direct use of unprocessed fish or fish products from wild fishery catch (sometimes referred to as “trash fish”), alone or in combination with other ingredients, as feeds for pangasius. Use of trash fish places undue pressure on vulnerable inshore fish stocks (including juveniles), can have deleterious effects on the culture environment, and represents a fish and public health risk, especially when uncooked.

IFFO reports that 25% of fishmeal currently being used for aquaculture is coming from by-products of fish processing. This amount is expected to increase. Although use of fish processing by-products is encouraged, the feeding of pangasius processing by-products to pangasius carries an unknown potential for spread of disease. At this time, no pangasius-specific scientific risk-assessment has been conducted to evaluate this risk. Therefore, PAD participants decided in Indicator 5.1.2 to disallow the use of pangasius processing by-products as feeds or ingredients of feeds for pangasius until such time as the risk has been deemed to be within an acceptable range as defined by the national competent authority.

While the PAD encourages the use of fishery processing by-products, it recognizes that this can result in higher feed conversion ratios (FCRs), resulting in tradeoffs between effluent concentration and efficient use of marine resources. The PAD has attempted to address this tradeoff through use of an eFCR standard (see Criteria 5.2) and effluent standards (see Principle 3).

Indicators 5.1.3 and 5.1.4 ensure that species classified as vulnerable or endangered, those that have protected status and those in which trade is illegal are not used as feeds or as feed ingredients.

Fish and fish products (such as fishmeal and fish oil) used to manufacture feed shall be from legal, reported and regulated fisheries that respect the Food and Agriculture Organization of the United Nations’ (FAO) “Code of Conduct for Responsible Fisheries,” such as ISEAL-certified schemes or those verified by IFFO and FishSource. Ideally, the goal is that all feeds shall be

from a certified sustainable fishery and a fishery where by-catch is maintained within acceptable limits. Feeds also shall not pose a threat to endangered species.

Current pangasius feeds (commercial or farm-made) mainly use locally sourced fishmeal from inshore fisheries off Vietnam, Bangladesh or India. Traceability and fisheries certification currently are a challenge in Asia and the infrastructure to support good management of fisheries stocks is limited. This makes the process of creating auditable farm level standards very challenging. Over time, it is envisaged that farms seeking certification under these standards will use feeds that contain fishmeal and fish oil that are from certified sustainable and traceable sources. The current plan for implementation calls for the producer to demonstrate that the feeds being used meet the requirements of the standards. This will require feed suppliers to provide information to support the farmer's declaration.

The PAD identified ISEAL member-certified fisheries as the most suitable sustainable fishery certification schemes, due to their transparency, verifiability and traceability. Currently, only the Marine Stewardship Council (MSC) meets these criteria. Quantities of MSC-certified fishmeal and fish oil are extremely limited, especially in the regions where pangasius is farmed. Demanding ISEAL-compliant fisheries would, under these circumstances, create serious difficulties for pangasius farmers and could negatively impact the rate of adoption of these standards. To avoid this, two schemes (FS and IFFO) for responsible certification were considered as effective interim indicators until certified fishmeal and fish oil are available and to give the industry time to adapt.

It should be noted that even the interim standards provide a significant challenge to the pangasius industry, as there are currently no local wild fishery sources of fishmeal and oil that comply with either interim scheme. Implementation of the interim or full standards without adequate consideration of the availability of fishmeal and fish oil that comply with these standards could unfairly disadvantage farmers seeking certification by forcing them to rely on feeds made with more costly imported ingredients and could also negatively impact adoption of the standards.

The timeframe for adoption of the standards should reduce the risk of non-compliance through lack of available and affordable ingredients, preferably locally sourced, while ensuring that there was sufficient incentive to improve on existing practices.

In order to reconcile these two points, two milestones have been identified by the PAD for compliance. If MSC-certified fisheries are available in the region (or, in the interim, stocks meeting the interim standards), certified farms will have a maximum of three years to switch to feeds made using these. Should such stocks not be available within five years after publication of the PAD standards, this standard will be revised to ensure that progress towards compliance is enforced.

Feeds use a number of ingredients from terrestrial sources, including animal and plant products, some of which may be genetically modified. Although there may be environmental and social issues associated with these ingredients, the PAD decided not to cover these under the current standards. It is intended that these will be covered in a separate feed and feed ingredients Dialogue or in a future revision of these standards.

Better Management Practices

Commercial feed

1. Ask your feed manufacturer if the feed
 - a. Does not contain any pangasius products
 - b. Does not contain any IUCN Red List threatened fish species
 - c. Does not contain any fish species listed in the Convention of International Trade in Endangered Species (CITES) Appendices I, II and III
 - d. If before 25 August 2015, contains only fish meal and oil which are:
 - i. Either scoring Fishsource ≥ 6.0 with no individual score < 6.0 or an N/A in the stock assessment category
 - ii. Or from a facilities certified as being in compliance with Sections 11 (Responsible Sourcing), 2 (Traceability), and 3 (Responsible Manufacturing) of the International Fishmeal and Fish Oil Organisation's (IFFO) "Responsible Sourcing Program for Certification of Responsible Practice for Fishmeal and Fish Oil Production
 - iii. Or from a fishery certified by an ISEAL member
 - e. If after 25 August 2015, contains only fish meal and fish oil from a fishery certified by an ISEAL member

If so, ask them to issue a statement indicating the source of all the fish products they use and that the above are all true.

Farm-made feed

2. Keep records of the ingredients you use in your feed
3. Never use uncooked or unprocessed fish and/or fish products (including trashfish) as feed. Any fish products should at least be cooked or processed
4. Never feed pangasius products to pangasius
5. Ask a university or other organization to help you to make sure that your feed is in compliance to the following
 - a. Does not contain any IUCN Red List threatened fish species
 - b. Does not contain any fish species listed in the Convention of International Trade in Endangered Species (CITES) Appendices I, II and III
 - c. If before 25 August 2015, contains only fish meal and oil which are:
 - i. Either scoring Fishsource ≥ 6.0 with no individual score < 6.0 or an N/A in the stock assessment category
 - ii. Or from a facilities certified as being in compliance with Sections 11 (Responsible Sourcing), 2 (Traceability), and 3 (Responsible Manufacturing) of the International Fishmeal and Fish Oil Organisation's (IFFO) "Responsible Sourcing Program for Certification of Responsible Practice for Fishmeal and Fish Oil Production
 - iii. Or from a fishery certified by an ISEAL member
 - d. If after 25 August 2015, contains only fish meal and fish oil from a fishery certified by an ISEAL member
6. Remember that using only waste from fish processing plants (provided they are not pangasius wastes) or aquaculture products does not require you to comply with the above requirements, as those are only applicable to wild fish

7. If you think you can identify if the fish product is compliant to the standards without assistance, then follow the instructions below

IUCN Red List:

Instructions:

- a. go to <http://www.iucnredlist.org/>
- b. follow to "other search options"
- c. select "Taxonomy"
- d. select "Animalia"
- e. indicate appropriate "Location", "Systems", "Habitat",
- f. click on "run search" and record species listed and whether they are threatened by the farming activity.

CITES

Instructions

- a. go to <http://www.cites.org/eng/resources/species.html>
- b. select option "Species" and click "find it"
- c. determine if the fish species being used is on any CITES list

FISH-SOURCE

- a. go to <http://www.fishsource.org/>
- b. select "Species" drop down tab to the left
- c. select the species that is utilized by the farm as a source of fish meal or oil
- d. if the species is not on the FishSource website, and the fish meal or oil is not sourced from by-products (trimmings) of capture fisheries, farms are not in compliance. Contact FishSource via Sustainable Fisheries Partnerships to identify the species as a priority for assessment. http://www.fishsource.org/site/contact_us
- e. if the species is assessed, select the top tab that reads "Scores"
- f. average of all scores must be 6.0 or higher and no "N/A" for "Stock Assessment" category (category 4 in FishSource scoring) to be in conformance

IFFO

- a. go to <http://www.iffo.net/>

- b. select IFFO RS on the menu on the left. This will take you to the IFFO Responsible Sourcing page
- c. select “Plants approved under the IFFO RS”. This will take you a PDF file which contains the list of approved sources. Open or save the document

ISEAL

- a. go to http://www.isealalliance.org/organisation/full_members
- b. Visit the website of each ISEAL full member to check what fisheries have been certified

Criteria 5.2: Efficient management of feed use on the farm

Applicable Standards (5.2.1 – 5.2.2)

Justification: Good on-farm feeding management and feeding efficiency are important to achieving the efficient use of available feed resources. Good feed management on the farm is essential to achieving efficient use of available feed resources and minimizing waste. Feeding rates and the conversion of feed to fish should be within good standards of efficiency and consistency. FFER and eFCR provide useful means to measure whether fish product use is being managed and wastes are being minimized.

Calculation and monitoring of feed conversion (the amount of feed used to produce a given weight of fish) is one of the simplest and most powerful ways that farmers can determine feed use efficiency. By encouraging farmers to record this number and work to reduce it, the standards will promote a better use of resources by the farmers, as well as a greater understanding of their activities.

The eFCR accounts for the biomass, or weight, of fish stocked and represents the amount of feed used to support the change in fish biomass over the farming period in an individual pond. The eFCR will vary between ponds on a site, the duration of the farming period and the life-cycle stage or size of the fish. On an individual farm site, the pond size, number of fish stocked and weight of fish harvested can also vary. Therefore, in order to provide a simple way to adjust for these factors in the overall performance of the farm, the weighted average eFCR is used.

Actual production data was obtained from over 100 individual ponds in different farms using different feeds and the weighted eFCR calculated. Based on the median value, the weighted eFCR was established as 1.68.

FFER is a measure of the efficiency with which fish products used in the feed are converted to live fish and requires some measure of the amount of fishmeal and fish oil used in the feed, as well as the efficiency of converting fish to fishmeal and fish oil. Accepted estimates for the yield of fishmeal and fish oil from wild caught fish range from 22–27% for fishmeal and 3-7% for fish oil, depending on the species and season. For the PAD, global average fishmeal yield of 22.22 percent and fish oil yield of 5 percent are assumed. However, where possible, these yields should be adjusted to reflect the actual species used in feeds.

It should also be noted that any trimmings, fishmeal or fish oil produced from fish processing by-products are not included in the calculation of FFER.

Better Management Practices

1. Keep detailed records of all the type and amount of feed you use in every pond, cage or pen
2. Keep detailed records of the amount of fish you harvest in every pond, cage or pen
3. Ask your fish seed supplier to write in the receipt for the fish you buy the total weight of the fish or the average weight and the total number of fish
4. Keep detailed records of the weight of the fish you stock in each pond, cage or pen

- Calculate the eFCR for each pond, cage or pen using the formula below

eFCR Calculation (for each pond, cage or pen):

$$\frac{\text{Feed Used (Metric Tons)}}{\text{Fish harvested (Tons) - Fish Stocked (Tons)}}$$

- Calculate the Yield for each pond, cage or pen using the formula below

Yield Calculation (for each pond, cage or pen):

$$\text{Fish harvested (Tons) - Fish Stocked (Tons)}$$

- Calculate the weighted eFCR for the whole farm using the formula below

Weighted eFCR (for the whole farm):

$$\frac{(\text{eFCR1} \times \text{Yield1}) + (\text{eFCR2} \times \text{Yield2}) + \dots + \text{eFCRn} \times \text{Yieldn}}{(\text{Yield1} + \text{Yield2} + \dots + \text{Yieldn})}$$

Using this formula you multiply for example the eFCR of pond 1 by the yield of pond 1, the eFCR of pond 2 by the yield of pond 2 and so on. Then you add up all those values and you divide the total by the total yield.

- For farmers to achieve the performance level of 0.5 Feed Fish Equivalency Ratio (FFER) required by the standards, the use of 0.5 kg of targeted wild caught fish in feeds should produce at least 1 kg of cultured fish.
- The FFER is a measure of how much wild fish is used to produce cultured fish. The most useful form of the FFER equation for pangasius farmers is as follows:

$$\text{FFER}_{\text{sum}} = \frac{\sum [(\% \text{ fish meal in feed type}^{**}) \times (\text{mt of feed type used})]}{\text{Fish production}^* (\text{mt}) \times 22.2}$$

Where

** % fish meal in a particular feed type is expressed as a whole number (7% fish meal inclusion is entered into the equation as 7.0);

mt of feed type used is the corresponding amount of feed for a given feed type that has a given fish meal inclusion percentage;

*Fish production is defined as follows:

Fish production = (Current standing stock of pangasius + pangasius harvested – initial standing stock) - fingerlings stocked from off-site production.

10. Farmers should keep records of all feeds purchased and, if using farm-made feed, of all feed ingredients used. The records should contain the amount of fish meal in each feed type which can be requested to be provided by the feed supplier; the total amount of each feed type used; and an invoice that confirms the purchase of the feed. Farmers should be prepared to do a full accounting of the amount of fish produced and the amount of feed used.
11. Depending on the size, type of pangasius produced or production system, the farmer may choose to increase or decrease the amount of fish meal in the feed. It should be noted, however, that increases in the amount of fish meal inclusion will limit the amount of feed that can be allotted to the fish under the standards. Over a production cycle the FFER should be equal to or less than 0.5, thus farmers must plan and calculate accordingly.
12. It is worth remembering that the use of trimmings from fish processing plants (excluding pangasius products) and aquaculture products used in feed are not accounted in the FFER formula above

PRINCIPLE 6: MINIMIZE ECOSYSTEM AND HUMAN HEALTH IMPACTS, WHILE MAXIMIZING FISH HEALTH, WELFARE AND ENSURING FOOD SAFETY

Criteria 6.1: Mortalities

Applicable Standards (6.1.1)

Justification: One of the major impacts of aquaculture can be the enhancement and transfer of natural or exotic diseases. However, it is very challenging to write standards to address this issue. One of the best options to ensure that disease transfer is minimized is through ensuring optimal fish health. A key measure of fish health is survival during the grow-out period.

The survival rates set in these standards serve as a performance-based indicator for successful disease prevention. Given that survival depends upon different factors, such as water quality and feeding, these indicators are also included elsewhere in this set of standards. The use of good management practices should result in a consistent survival rate among holding units. The proposed standard provides room for isolated mortalities, but farmers will have to react quickly to prevent disease from spreading to other holding units and farms.

Although mortality is related to the size at stocking, these standards do not specify seed size, since stocking different sizes is a management practice that the farmer can consider to reach compliance to this performance-based standard.

Farmers shall provide written records on the number of fish stocked and number of fish harvested. Numbers can be calculated by taking the total weight and dividing it by the average weight of the fish. Farmers shall maintain details on the weight of each basket/container at harvest, in addition to the total weight.

Better Management Practices

1. Keep seed purchase receipts showing total number or total biomass and average size of fish stocked in every pond, cage or pen
2. Keep selling receipts including total quantity and average fish size harvested in every pond, cage or pen
3. Calculate the average mortality in every pond, cage or pen using the formula below

Real Percentage Mortality (for each pond, cage or pen) =
$$\frac{(\text{number of fingerlings stocked} - \text{number of harvested fish}) \times 100}{(\text{number of stocked fish})}$$

4. Calculate the average mortality in your farm by adding all the % mortality in your ponds, cages and pens and dividing it by the total number of ponds, cages and pens you measured the % mortality on.

5. If the mortality is higher than 20%, you cannot comply with the standards and you may do one of the following:
 - a. involve an aquatic animal health specialist to help you improve the health of your fish
 - b. Stock healthier fish
 - c. Stock larger fish

Criteria 6.2: Veterinary medicines and chemicals

Applicable Standards (6.2.1 – 6.2.7)

Justification: Veterinary medicines and chemicals can play an important role in maintaining fish health and survival, however, the over use of these medicines and chemicals can have environmental as well as human health impacts.

Better Management Practices

1. Contact the local and/or national authorities and ask them for the list of veterinary medicines, chemicals and biological products approved for aquaculture. You must use only products in that list
2. If you know the country where your fish will be sold, make sure you do not use any of the products which are banned for food fish use in that country. This information will be available with the local and/or national authorities in charge of regulating the export of pangasius.
3. If you do not know the country where your fish will be sold, contact the local and/or national authorities and ask them what are the top 5 countries importing pangasius from your country. Ask the authorities also what are the products banned on those 5 markets and make sure you do not use any products banned in those 5 countries.
4. You should not use any of the substances which are considered Critically Important Antimicrobials for Human Medicine by the World Health Organization (WHO), not even if those substances are approved for use in your country. This list can be found at http://www.who.int/foodborne_disease/resistance/antimicrobials_human.pdf Look also for any updates of this list. If you cannot find the list or you are unsure about whether it has been updated ask somebody (for example university staff) to help you.
5. Keep detailed records of all the veterinary medicines, chemicals and biological products that you use. Records should specify in which pond, cage or pen you used each product.
6. Record also the chemical or therapeutant supplier's name and contact information
7. Do not keep any banned or non-approved products in your farm, not even if you do not intend to use those products in your farm
8. When you have a health problem contact an aquatic animal health specialist. The aquatic animal health specialist must be
 - a. either an aquatic animal health specialist designated by the government. If so s/he should show you the regulation stating s/he is an officer responsible for aquatic animal health control in the country. Keep copies of that regulation and of the officer's ID card
 - b. or a veterinarian with at least three months of academic training on fish health management (for a total of at least 60 hours). This training may be included with the veterinary degree. The veterinarian should show you documents proving

his/her degree and the fish health training. You should make photocopies and keep them as reference

- c. Or an aquaculturist (with university or vocational degree) who have completed at least three months of training on fish pathology and treatment (for a total of at least 60 hours). This training may be included with the university or vocational degree. Similarly, the aquaculturist should show you documents proving his training. Remember to keep copies of those documents
9. Before you use any veterinary medicines or chemicals for therapeutic use you must ask the aquatic animal health specialist to write the following
 - a. what is the health problem affecting your fish
 - b. what substance should be used
 - c. how should the substance used (e.g. frequency, amount etc.)
 - d. how should the substance to use be handled and stored
 - e. who needs to be informed about the disease and how
 - f. how to limit the spread of the disease to neighboring wild or farmed populations
 - g. any additional recommendations
 10. If you need to inform any person of the disease occurring in your farm, ask them to sign a letter stating that they had been informed
 11. Unless specified (in writing) differently by the specialist, you should always follow the label specifications concerning the use of the substance you use for the purpose you are using it
 12. Keep the labels of the products you use to demonstrate why you applied the product in the way you applied it
 13. Record water temperature daily
 14. After using a substance, make sure you wait for some days before you harvest the fish. The number of days is sometimes indicated on the product label. If it is not, you should wait for the number of days indicated on the table below. Notice that the number of days depends on the average temperature in your farm.

Average temperature	Number of days before harvest
20	38
21	36
22	35
23	33
24	32
25	30
26	29
27	28
28	27
29	26
30	25
31	25
32	24

33	23
34	23
35	22

15. You should never use a veterinary medicine (e.g. antibiotics) before the aquatic animal health specialist identifies a specific disease needing treatment. You can however use vaccines before the disease occurs.
16. Similarly, you should never use a veterinary medicine to make the fish grow faster, as veterinary medicines should be used only to treat a specific disease, and not before a disease occurs. Again, vaccines can be used if you think they help your fish grow faster
17. Obtain a statement from the specialist indicating that he found no evidence of antibiotics having been used for a specific problem before he/she was consulted

Criteria 6.3: Pangasius health plan

Applicable Standards (6.3.1)

Better Management Practices

1. Write a pangasius health plan making sure that the plan includes the following information
 - Name and location of farm
 - List of previously identified diseases
 - Planned preventive methods and treatments (including chemicals, veterinary medicines, biological products and withdrawal periods) to be administered for previously identified diseases
 - Pond preparation protocols
 - Vaccination protocols, if any
 - Bio-security procedures
 - Screening program in place for relevant pathogens
 - Water management protocols for disease prevention
 - Records of routine assigned aquatic animal health specialist visits
 - Frequency and methods of removal of sick and disposal of dead animals
 - Other prevention plans where applicable
 - Procedures for transportation of seed and of harvested fish
 - Mechanism of responding to disease outbreaks, including reporting disease outbreaks to the fish health specialist and to others as appropriate
 - Protocols for preventing disease spread (e.g., through water discharge and fish)
2. Ask the aquatic animal health specialist to review it and to approve it, by signing it.
3. Review the aquatic animal health plan every year, update it as needed and ask the aquatic animal health specialist to approve the revision.

Criteria 6.4: Holding-unit specific record-keeping

Applicable Standards (6.4.1 – 6.4.4)

Justification: Daily records of mortality and clinical signs will also be used to revise the PAD standards so that performance-based metrics can be identified.

Note: Additional performance standards on fish health could be identified when the PAD standards are revised

Better Management Practices

1. Keep detailed records of the name, reasons for use, dates, amounts and withdrawal times of all veterinary medicines and chemicals used in each pond, cage or pen. Make sure that these are in accordance to what the aquatic animal health specialist and/or the product labels say.
2. For every time you stock fish, obtain from the place where you buy the fish seed receipts reporting
 - a. Date
 - b. Description of gross signs and abnormalities (if any) at the time of selling
 - c. List of any veterinary medicines, chemicals and biological products used from spawning
 - d. Results of pathogen testing following the legislation in the country of production.
3. Monitor the health of the fish every day and for every day record the following
 - a. presence of abnormalities i.e. feeding behaviour, swimming behaviour, gross external signs (such as lesions, spots, parasites and fin erosion)
 - b. number of dead fish
4. Ask the aquatic animal health specialist to tell you what the normal average daily mortality levels for your farm are at: 1 week, 1 month and for every month till harvest. Make sure you get a signed letter from the specialist specifying these levels
5. Every time that the daily mortality in any of the ponds, cages or pens exceeds the levels indicated by the aquatic animal health specialist you must contact the specialist and get his/her advice on what to do (see also other BMP under this principle)

Criteria 6.5: Fish welfare

Applicable Standards (6.5.1 – 6.5.3)

Justification: A minimum growth rate was selected based on the assumption that farmed fish under good welfare conditions will show a good growth performance. However, the minimum growth rate standard shall not be used to exclude organic or low intensity systems.

Fish stocking density is an important element of maintaining fish health and welfare. There is always a need to find the right balance between space efficiency, farming performance, disease control and fish welfare. Guidance on maximum fish densities for ponds, pens and cages (at any time during production) is an important tool for maintaining fish health.

Better Management Practices

1. Keep receipts of the size of the fish you stock and you harvest
2. Keep records of the number of days you cultured fish in every pond, cage or pen
3. Calculate the average growth rate of your fish in every pond, cage and pen using the formula below

$$\text{Average Growth Rate (g/day/fish)} = \frac{(\text{weight at harvest (g)} - \text{weight at stocking (g)})}{\text{number of days of production}}$$

4. Add up all the average growth rates in the ponds, cages or pens in your farm and divide it by the number of ponds, cages and pens to obtain the average for your farm. If the total value is lower than 3.85g per day than you are not in compliance with the standards. You should therefore consider:
 - a. Improving the health of your fish
 - b. Improving the quality of the fish you stock
 - c. Improving the feeding regime to make sure your fish grow better
5. Draw a sketch of the farm showing location of each pond, pen and cage and indicating the size (in m²) of every pond or pen and the volume (in m³) of every cage.
6. Keep records of the number of fish you have in each of your ponds, pens or cages and the average fish size.
7. Make sure the density of the fish in your **ponds or pens** never exceeds 38 kg per square meter. If it reaches 38 kg/m² and you are planning to make the fish grow some more, you should move some of the fish to another pond or pen where the density is lower, otherwise you will not be in compliance with these standards

8. Make sure the density of the fish in your **cages** never exceeds 80 kg per cubic meter. If it reaches 80 kg/m³ and you are planning to make the fish grow some more, you should move some of the fish to another cage where the density is lower, otherwise you will not be in compliance with these standards

Criteria 6.6: Predator control

Applicable Standards (6.6.1 – 6.6.2)

Justification: Predators can be a serious problem in farms. It is however possible to control predators without killing them. This is particularly important for endangered species of animals

Better Management Practices

1. Keep a list of all the devices (e.g. traps) you use to control predators.
2. Make sure you never use a device that would kill predators. A combination of barriers (netting or strings over culture enclosures) to fish and deterrent devices (noise cannons, scarecrows, human movement) has proven to be a more effective means of controlling the predation of pangasius.
3. The highest rate of mortality due to predation occurs when fish are juveniles, thus barriers and deterrents should be strategically employed in and around the juvenile culture areas of a farm.
4. Farmers can purchase many types of barriers for culture enclosures, but these barriers can also be made using relatively inexpensive supplies. Strings made of a variety of materials can be stretched and secured to anchor points around a pond. These “homemade” barriers are often used on large enclosures such as ponds.
5. Netting, either purchased or constructed on the farm can be lined over the water surface. Netting is often purchased or constructed for cover smaller culture enclosures such as small ponds, raceways, tanks or cages.
6. Deterrent devices such as noise makers can be purchased and should be moved regularly around the areas most prone to predation. Birds, in particular, become desensitized to these noises when they are in the same location.
7. Scarecrows, mannequins, animal statues can also be used to scare away birds, but again, these devices require relocation every 2-3 days so predators do not become adjusted to the presence of such devices.
8. Human movement is also a useful tool employed as a means of deterring predators, particularly if the human movement is coupled with erratic noise and sticks and ropes waved in the air.
9. For non-human predation on pangasius farms, the best results for reducing mortalities are from the employment of a combination of barriers and deterrent devices. This will result in the most uncommon situation that predators will encounter, and thus provide a level of discomfort.
10. In rare instances predators may become trapped or tangled in some of the barrier devices. If this occurs, you should attempt every means to release the animal from these barriers. However, if the predator that has become trapped is severely wounded or would suffer greatly from the continued entrapment, you may euthanize these animals.
11. In some locations where pangasius aquaculture takes place, rare and unique fauna exists. Many of the rarest of animals are in endangered or threatened categories. The International Union for the Conservation of Nature (IUCN) maintains a database, the Red List, which

identifies these species. Under these standards, there is no tolerance for the killing of any Red Listed species. You should pay special attention to their local fauna and the IUCN Red List, and implement precautionary measures to deter these types of species if they migrate through or inhabit surrounding areas of farms. Precautionary measures may include increased number of deterrent devices around enclosures; secondary impingement protection around water pumped or diverted from natural areas and increased human activity and monitoring. Instructions for using the IUCN Red List database follow:

Instructions:

- a. go to <http://www.iucnredlist.org/>
- b. follow to "other search options"
- c. select "Taxonomy"
- d. select "Animalia"
- e. indicate appropriate "Location", "Systems", "Habitat",
- f. click on "run search" and record species listed and whether they are threatened by the farming activity.

Secondary impingement protection when potential IUCN Red List species, categorized as vulnerable, endangered, critically endangered, extinct in the wild or extinct are known to be in region (including receiving and source waters) of farm

12. Human predation or theft of fish requires a more community-oriented means of establishing trusting relationships. These efforts are described in BMPs addressing social and community concerns in later sections of this tool.

PRINCIPLE 7: DEVELOP AND OPERATE FARMS IN A SOCIALLY RESPONSIBLE MANNER THAT CONTRIBUTES EFFECTIVELY TO COMMUNITY DEVELOPMENT AND POVERTY ALLEVIATION

Criteria 7.1: Labor law

Applicable Standard (7.1.1)

Justification: Labor laws in the producing country set the minimum requirements for a farm to operate legally. For this reason, the laws shall be complied with in full. If the requirements of such laws somehow differ from the PAD standards, farmers are reminded that they shall comply with all the PAD standards, including those under this criteria (labor law) and the ones under other criteria and issues.

Better Management Practices

1. Contact the local or national authorities and ask them what are the labor laws and regulations (which are the laws and regulations applicable to farms where there are employees) in your area. Make sure you follow all those laws and regulations, especially the ones on:
 - a. labor contracts
 - b. child labor
 - c. working time
 - d. working/living conditions
 - e. minimum wage
 - f. benefits/allowance
 - g. health and safety
 - h. presence of on-farm regulation
2. Keep copies of all those laws and regulations

Criteria 7.2: Child labor and young workers

Applicable Standards (7.2.1 – 7.2.2)

Justification: Adherence to the child labor codes and definitions included in this section indicates compliance with what the International Labour Organization (ILO) and international conventions generally recognize as the key areas for the protection of child and young workers. Children are particularly vulnerable to economic exploitation, due to their inherent age-related limitations in physical development, knowledge and experience. Children need adequate time for education, development and play and, therefore, shall never be exposed to work or working hours that are hazardous to their physical or mental well-being. To this end, the standards related to what constitutes child labor will protect the interests of children and young workers in certified aquaculture operations.

Better Management Practices

1. Keep an updated list of all the employees in your farm
2. Keep photocopies of the ID documents of all the workers listed
3. Never employ a staff who is younger than 15 years old
4. For every employee between 15 and 18 years of age write their job description and make sure it
 - a. includes only light work, which is work that is 1) not likely to be harmful to a child's health or development and 2) not likely to prejudice their attendance at school, participation in vocational orientation or training programs, or diminish their capacity to benefit from
 - b. does not include any hazardous work, which is work which, by its nature or circumstances in which it is carried out, is likely to harm the health, safety or morals of workers
5. Keep records of the number of hours each employee works every day
6. For workers between 15 and 18 years of age keep records of the hours each employee spends at school and make sure that work
 - a. does not jeopardize schooling
 - b. when added to the hours of schooling, work does not exceed 10 hour/day

Criteria 7.3: Forced and compulsory labor

Applicable Standard (7.3.1)

Justification: Forced labor (e.g., slavery, debt bondage and human trafficking) is a serious concern in many industries and regions of the world. Ensuring that contracts are clearly articulated and understood by workers is critical to determining that labor is not forced. The inability of a worker to freely leave the workplace and/ or an employer withholding original identity documents of workers are indicators that employment may not be at-will. Employees shall always be permitted to leave the workplace and manage their own time. Employers are never permitted to withhold original worker identity documents. Adherence to these policies shall indicate an aquaculture operation is not using forced, bonded or compulsory labor forces.

Better Management Practices

1. Workers must be free to terminate their employment when they do not want to work in your farm any more and must receive full payment until the last day of their employment, provided they gave you the period of notice as specified in the contract
2. All your employees should free to leave workplace and manage their own time based following what is stipulated in the contract
3. You shall never withhold the original identity papers or documents of your employees
4. You shall not withhold any part of workers' salaries, benefits, property or documents in order to oblige them to continue working for you.
5. Your employees shall not to be obligated to stay in job to repay a debt

Criteria 7.4: Health and safety

Applicable Standards (7.4.1 – 7.4.4)

Justification: A safe and healthy working environment is essential for protecting workers from harm. It is critical for a responsible aquaculture operation to minimize these risks. Some of the key risks to employees include hazards resulting from accidents and injury. Consistent and effective employee training in health and safety practices is an important preventative measure. When an accident, injury or violation occurs, the company must record it and take corrective action to identify the root causes of the incident, remediate, and take steps to prevent future occurrences of similar incidents. This addresses violations and the long-term health and safety risks. Finally, while many national laws require that employers assume responsibility for job-related accidents/ injuries, not all countries require this and not all employees (e.g., migrant and other workers) will be covered under such laws. When not covered under national law, employers must prove they are insured to cover 100 percent of employee costs in a job-related accident or injury. Although covering the costs associated with permanent disabilities generated from an employment accident is important, this is, at present, unrealistic within the pangasius industry. However, if possible, including coverage for permanent disabilities will be pursued in PAD standard revisions.

Better Management Practices

1. Keep an updated list of all the health and safety hazards. Hazards are things with the inherent potential to cause injury or damage to people's health for instance unequipped to handle heavy machinery safely/unprotected exposure to harmful chemicals etc.
2. For each hazard, develop Standard Operating Procedures (SOP), which are procedures describing how to deal with it.
3. Make sure that all your employees are adequately protected against hazards
4. Train all employees on the hazards they have to deal with in their job and make sure they fully understand and remember the SOP.
5. Provide access to potable/safe drinking water to your employees
6. Provide your employees with toilet access and other sanitary conditions for disposal of human waste
7. Provide your employees with housing constructed of material to sustain local conditions (e.g. rain, wind etc.)
8. Keep records of all the accidents occurring in your farm, even if they are minor. After each record, state what preventive and corrective actions you took, for example what you did to ensure that the risk of an accident happening again was lower.
9. If not covered under the national law, you must pay health insurance for all the workers who you employ for a period longer than 3 months per year. Insurance must cover 100% of any job-related accident or injury.

Criteria 7.5: Freedom of association and collective bargaining

Applicable Standard (7.5.1)

Justification: Having the freedom to associate and bargain collectively is a critical right of workers because it allows workers to have a more balanced power relationship with employers when doing such things as negotiating fair compensation. Although this does not mean all workers of a certified aquaculture operation must be in a trade union or similar organization, workers must not be prohibited from accessing such organizations when they exist. If they do not exist or are illegal, companies must make it clear that they are willing to engage in a collective dialogue through a representative structure freely elected by the workers.

Better Management Practices

1. Workers, including temporary workers, must be free to form or join organizations to defend their rights (including their right to collective bargaining) without interference from you or any other employee and without suffering negative consequences as a result of exercising this right
2. This right should be clearly stated in the contract
3. Inform the employee of this right and make sure they are fully aware of it
4. You must allow any representatives of trade unions or other organizations that your employees have joined to have access to their members in the workplace at reasonable times

Criteria 7.6: Discrimination

Applicable Standard (7.6.1)

Justification: Unequal treatment of employees, based on certain characteristics (such as sex or race), is a violation of workers' human rights. Additionally, widespread discrimination in the working environment can negatively affect overall poverty and economic development rates. Discrimination occurs in many work environments and takes many forms. In order to ensure that discrimination does not occur at certified aquaculture farms, employers must prove their commitment to equality with an official anti-discrimination policy, a policy of equal pay for equal work, as well as clearly outlined procedures to raise/ file and respond to a discrimination complaint in an effective manner. Evidence, including worker testimony, of adherence to these policies and procedures will indicate minimization of discrimination.

Better Management Practices

1. Write an anti-discrimination policy document, which is a document stating that your company/farm does not engage or support discrimination in hiring, remuneration, access to training, promotion, termination or retirement based on race, caste, national origin, religion, disability, gender, sexual orientation, union membership, political affiliation, age or any other condition that may give rise to discrimination
2. The policy should clearly state that the rights of pregnant and lactating mothers are protected.
3. You or anybody in your company must not interfere with the rights of personnel to observe tenets or practices, or to meet needs related to race, caste, national origin, religion, disability, gender sexual orientation, union membership, political affiliation or any other condition that may give rise to discriminations

Criteria 7.7: Fair and progressive practices toward workers (including disciplinary practices)

Applicable Standard (7.7.1)

Justification: The rationale for discipline in the workplace is to correct improper actions and maintain effective levels of employee conduct and performance. However, abusive disciplinary actions can violate workers' human rights. The focus of disciplinary practices shall always be on the improvement of the worker. A certified aquaculture operation shall never employ threatening, humiliating or punishing disciplinary practices that negatively impact a worker's physical and mental health or dignity. Employers that support non-abusive disciplinary practices as described in the accompanying guidance, as well as evidence from worker testimony, shall indicate that a certified aquaculture operation is not employing abusive disciplinary practices.

Better Management Practices

1. Farmers should never make any use of or support for (e.g. by employing subcontractors) corporal punishment, mental or physical coercion, or verbal abuse.
2. Farmers should not allow fines or wage deductions as a method for disciplining workers.
3. Farmers should develop procedures for workers such that they understand situations in which disciplinary action is required, and they establish the use of progressive verbal and written warnings. The farmer's aim should always be to improve the worker before letting him/her go.
4. Farmers shall never employ threatening, humiliating or punishing disciplinary practices that negatively impact a worker's physical and mental health or dignity. These practices include the intentional use of power, including verbal abuse, isolation, sexual or racial harassment, intimidation, or threat of physical force

Criteria 7.8: Working hours

Applicable Standards (7.8.1 – 7.8.4)

Justification: Workers shall not be obliged to live on the farm. Abuse of overtime working hours is a widespread issue in many industries and regions. Workers subject to extensive overtime can suffer consequences in their work/life balance and are subject to higher fatigue-related accident rates. In accordance with better practices, employees in certified aquaculture operations are permitted to work within defined guidelines beyond normal work week hours but must be compensated at premium rates. Requirements for time off, working hours and compensation rates, as described above, should reduce the impacts of overtime.

Better Management Practices

1. Keep timesheets stating all the hours being worked every day by your employees
2. Workers should work a maximum of 8 hours/day or 48 hours/week. These hours however do not have to be consecutive hours
3. Workers should have the right to leave the farm after completing their working hours.
4. Develop written contracts which clearly state the maximum number of hours to be worked and the employees' right to leave the farm during their free (non working) time
5. At a minimum, employees should have two nights per week off (if residing on the farm) and a total of four days per month off (for all workers)
6. Working overtime should not be compulsory for your employees. They should be free to decide voluntarily if they want to work overtime or not and they should not be punished in any manner for deciding not to work overtime
7. Working overtime should occur on an exceptional, rather than regular, basis, which means that you should not plan for your workers working overtime, but you should ask your workers to work overtime only when unexpected events occur.
8. The maximum number of overtime hours for any single employee should be 12 hours. Hence if an employee works 40 h per week according to his/her contract, he/she cannot work more than 52h in any week.
9. You should pay overtime work at a rate higher than the rate you pay normally. The premium rate should be 20% higher than normal. This means that if you pay an employee USD 80 per month, as there are 4 weeks in a month, you are paying that employee USD 20 per week. If your employee works 40h per week, then you are paying the employee USD 0.50 per hour. If you are asking your employee to work overtime you should pay him/her USD 0.60 per hour (which is USD 0.50 plus 20% of USD 0.50, which is USD 0.10). This means that, if the employee works 5h overtime in one week you should pay him/her USD 3.
10. Keep receipts signed by your employees stating how much money they have been paid and for what (e.g. salary for March 2011 etc.).

Criteria 7.9: Fair and decent wages

Applicable Standards (7.9.1 – 7.9.3)

Justification: Workers shall not be obliged to live on the farm. Abuse of overtime working hours is a widespread issue in many industries and regions. Workers subject to extensive overtime can suffer consequences in their work/life balance and are subject to higher fatigue-related accident rates. In accordance with better practices, employees in certified aquaculture operations are permitted to work within defined guidelines beyond normal work week hours but must be compensated at premium rates. Requirements for time off, working hours and compensation rates, as described above, should reduce the impacts of overtime.

Better Management Practices

1. Farmers should ensure wages paid for a standard working week always meet, at least, legal and industry minimum standards; cover basic needs of personnel and provide some additional discretionary income.
2. Basic needs should be assessed in consultation with workers and their representative organizations and assessing the cost of living using credible sources. The process should be documented and annexed to the contract of every employee
3. You should have a clear and transparent mechanism for setting wages. This mechanism should be based on the principle of equal pay for equal work. The mechanism should be written and annexed to employees contracts
4. All your employees should be aware of this mechanism
5. Farmers should make payments in a manner convenient to workers. For example if an employee wants to be paid in cash, you should pay him in cash, while if an employee prefers being paid through bank transfer, then you should pay him through bank transfer

Criteria 7.10: Labor contract

Applicable Standards (7.10.1 – 7.10.3)

Justification: The key to a fair and transparent exchange (work for income) is an agreement that is clear to both parties and can be verified during the contract period. Signed documents that both parties have access to at will are important for verification to take place. This will also ensure that conflicts around misunderstandings can be avoided and, if they occur, discussed in a mutually transparent manner. Revolving labor contract schemes, designed to deny long-time workers full access to fair and equitable remuneration and other benefits, are prohibited.

Better Management Practices

You should prepare written contracts for every employee you employ

You should give copies of the contract to your employees

You should explain clearly to your employees the meaning of every part of the contract and make sure they understand the contracts they have with you or your farm

The maximum length of probation period stated in the contract for workers, other than farm managers and workers with a university degree, should be 1 month and you should respect that.

The maximum length of probation period stated in the contract for farm managers and workers with a university degree should be 2 months and you should respect that.

Criteria 7.11: Management systems

Applicable Standards (7.11.1 – 7.11.5)

Justification: Employers shall put in place systems that allow workers to communicate freely on any issues of concerns. Such a system should protect the anonymity of “whistle-blowers.” Employers shall also keep records and track and resolve issues to the maximum of their ability. The figure of 90% is arbitrary and is meant to indicate that almost all the grievances are resolved quickly. Having a metrics-based standard also allows for the percentage of complaints being addressed to be set at a higher level during revisions to these standards. It is recognized that, at present, most suppliers and service providers contracted by farmers may not offer suitable health and safety conditions to their workers and that this is beyond the control of the farmer. A period of one year is, however, considered by the PAD to be a realistic timeframe for farmers to identify suppliers and providers that do offer such conditions.

Better Management Practices

1. You should ensure that all workers have an appropriate method to communicate anonymously with you on matters relating to labor rights and working conditions. At a minimum you should put compliant boxes around the farm, to allow employees to submit their complaints, if any
2. You should keep a register recording all issues raised by workers (including compliant forms), date and response taken.
3. You should solve at least 90% of the complaints within 1 month from the time when these have been registered. Only conflicts that both your employees and you agree are solved may be considered solved
4. For the remaining complaints, you should have a clear and written plan on how to address them
5. Most often, the businesses you subcontract (for example to remove sludge or to harvest) have employees. The conditions of employment of those employees are likely not to be in compliance with these standards. Although for some time you will be able to be certified while using sub-contractors that do not apply “proper” labor conditions, after 1 year of being certified, every employee (even if not employed by you but employed by a subcontractor) should benefit from the rights stated in these standards. If you cannot do that, you will lose certification

Criteria 7.12: Record keeping

Applicable Standard (7.12.1)

Justification: Compliance to standards on overtime requires a record of the hours worked by every employee to be accurately kept.

Better Management Practices

1. You should keep records of the hours worked by every worker employed in your farm
2. You should have an updated list of employees and timesheets for all the active and past (at least 6 month before obtaining certification) employees

Criteria 7.13: Participatory social impact assessment for local communities

Applicable Standards (7.13.1 – 7.13.2)

Justification: The people who live in communities around pangasius farms are critical stakeholders. Regular communication and consultation can build trusting relationships with local communities and prevent or minimize conflicts. The farms should contribute to poverty alleviation and food security so that there are net benefits to the local community.

The focus of the p-SIA criteria is on risks and impacts between surrounding communities and the farm. Information about technical operations on the farm that have no bearing on risks and impacts outside the farm need not be documented nor disclosed in the participatory processes.

The extent to which the steps in the p-SIA are done by outside professionals, or with outside professional consultants, or (almost fully) localized, with or without the use of high-end technical tools, can be appropriate to the scale of the farm. Area-size (ponds and additional grounds dedicated to the farm), farm-technology (intensive to extensive), and capital lay-out are good indicators to make judgments on the appropriateness of the methods and tools used in the p-SIA.

Small farmers can do these steps in locally organized processes and use hand-written documentation that gets posted on village public sign boards. Industrial estates of large size and investment will need to hire professional experts to assist in this process and are expected to adhere to methodological descriptions provided by the UNDP or World Bank. The only addition to existing generic descriptions of the p-SIA methodology is that a closure and reclamation plan is requested.

For new farms, the focus of this criteria lies in assessing future risks and impacts. It will be done before a physical start is made with farm establishment. For existing farms, the focus lies in assessing actual risks and impacts. In both cases, the outcome is oriented towards identifying how to responsibly deal with these risks and impacts in negotiated processes with those who are affected.

In group certification approaches (cooperatives or an area of individual farms of which products are not individually traceable in trade), the whole group is the unit of interest.

Credible social sustainability standards must be able to respond to real human concerns that arise in communities located near the farm, as well as on the farm. In particular, appropriate consultation must be undertaken within local communities so that potential conflicts are properly identified, avoided, minimized and/or mitigated through open and transparent negotiations on the basis of an assessment toward risks and current impacts on the surrounding communities.

Communities will have the opportunity to be part of the assessment process. The impacts of aquaculture operations on minorities and those prone to discrimination will be accounted for, and opportunities for these groups of people should be identified, evaluated and addressed. Negative impacts may not always be avoidable. However, the process for addressing them must be open, fair and transparent. Therefore, these community standards focus on due diligence through dialogue and negotiation with surrounding communities.

Better Management Practices

1. You should engage with your neighbors and other local communities to conduct a participatory Social Impact Assessment. This pSIA does not need to be too complicated, but it should include at least the following aspects

a. The process and transparency of communication with stake-holders (e.g., affected people, groups and communities). You should prepare a list of people that may be affected by your farm and how you communicated with them to conduct this pSIA

b. Quality of the p-SIA process to allow people to assess whether this pSIA is participatory and transparent. This part should include

- The intent to conduct a p-SIA should be locally publicly communicated with sufficient time for interested parties to participate and/or get informed
- In listing stakeholders, in making impact descriptions, and in preparation of a final p-SIA report-document, meetings with the listed stakeholders (or by stakeholders chosen representatives) have taken place
- These meetings have been minuted and these records are attached to the final report; names and contact details of participating stakeholders included
- Evidence is provided that draft and final p-SIA reports have been submitted to local government representative and, if stakeholders so desired, to a legally registered civil organization chosen by the stakeholders

c. An assessment of the risks, and actual impacts of your farm or intended farm (if you are planning to build one) and at least two alternatives. For example:

- what will happen if the farm continues to exist (or is built)? This is the current plan
- What would happen if the farm stopped farming (or was not built)? This is an alternative which must be assessed
- What would happen if the farm had also water treatment ponds? This is a potential alternative scenario
- What would happen if the farm was only 2/3 of its size? This is another alternative scenario that you may consider.

In this part of the assessment, concepts to cover should include:

- Economic aspects (influence on employment opportunities, influence on other livelihoods in community)

- Natural resource access and use (land and water tenure, influence on quality and availability of natural resources incl. water)
- Human assets (food security, health and safety, education, indigenous knowledge)
- Physical infrastructure (access to roads, electricity, telephone, housing, waste disposal systems)
- Social and cultural aspects (indigenous/traditional/customary rights and beliefs, social exclusion/inclusion, gender equity, changes in age composition of the community, local informal institutions and organizations)
- Governance aspects (influence of aquaculture on norms, taboos, regulations, laws, conflict management, and whether these changes add up to more or less transparency, accountability and participation in decision making)

d. Research and report probable impacts that are likely to be most important. In doing this, it is important to arrange meetings with stakeholders to let them prioritize as well as to let them express how they assess/view/feel; identify both positive and negative risks and impacts. (this way of working also paves the way for handling trade-offs.)

e. Do deeper investigations into impacts that are considered priorities by the community with focus on the question “What changes will lead to if they indeed come about?” Include:

- Physical effects to man-made and natural structures and processes
- Likely adaptations and the social and economic effects of making such adaptations
- How these effects and indirect effects would compare to having no intervention
- How effects may or might be cumulative.

f. Make recommendations to maximize the positive and minimize the negative, with consideration to compensation options for those lands and people impacted; include recommendations on how to avoid these issues with the intended farm or farm development

g. Propose a plan to mitigate the impacts identified by the community. You should include also a closure and reclamation plan explaining how repair or restoration will take place if the farm was to close or go bankrupt.

h. Develop and approve, with all stakeholders, a monitoring plan and indicators on positive and negative risks and impacts. This step should be conducted using

- Focus Group Discussions (FGD), which is a rapid way to collect data from different stakeholders in a group-setting. This for example would consist of meetings with the agriculture farms in your area, meetings with fishermen, etc. This process is very useful to brainstorm around concerns, to cross-check information for validation, or to obtain a list with a variety of reactions to hypothetical or intended actions

- Participatory Rural Appraisal (PRA): which means adopting an approach and method to investigate with emphasis on local knowledge and perception. It includes group exercises through which stakeholders are encouraged to share information and make their own appraisals and formulate their own solutions.
- i. A summary with recommendations and conclusions is made available to all involved in the process and, through public local notices, made accessible to all members of the local community
 2. Distribute the pSIA to household representatives (at least 10) within the community, the local government and at least one civil society. When you distribute the pSIA, make sure you obtain signed letter stating having received copies of the p-SIA

Criteria 7.14: Complaints by local communities

Applicable Standards (7.14.1 – 7.14.3)

Justification: Mutually fair and open negotiations will help resolve conflicts. The farm must, therefore, have a conflict resolution policy in place that describes how to make complaints as well as how the farm intends to address them. The contents of this policy must be known publicly (in surrounding communities) and the farm must provide verification as to the progress it makes in resolving outstanding concerns.

The standard makes allowance for the eventuality that not all conflicts can be resolved easily and quickly. It must also be mentioned that conflicts may not necessarily be caused by farm development and/or operation. But the farm shall exercise due diligence (i.e., actively seek to determine and solve) with regard to complaints, provide the utmost effort to avoid doing harm to the interests of surrounding communities, and provide evidence for this according to the standard.

Better Management Practices

1. You should develop a policy for solving conflicts with local communities. The policy shall state how conflicts and complaints are recorded and tracked transparently and explain how to respond to all received complaints
2. This policy should be applied and verifiable, which means that people can check if you have been applying it or not
3. You should have complaint boxes in different locations around your farm to allow the local community to submit any complaints
4. You should keep complaint registers where you keep details of all the complaints you receive
5. You should also issue receipts indicating that the complaint has been received. These should be written in a language understandable by the local community
6. You should always try to solve all the conflicts you have with local communities. At a minimum, you should solve:
 - 50% of the conflicts within 6 months
 - 75% of the conflicts within 1 year
 - All the conflicts within 2 years
7. The process you adopt to solve any conflicts should be documented and the meetings you have with the people that have complaints towards your farm are summarized. Summaries should include an agenda (the list of concerns), resolutions or agreements reached, who shall take what action by when, and a list of participants. Local government and at least one civil society or customary organization chosen by the community shall have access to the conflict resolution process and the relevant documentation.

8. A conflict should be considered resolved if both you and the person complaining agree to take it off the agenda or list of complaints. When a conflict is solved, get a letter from the person complaining to indicate that the conflict was indeed solved
9. Obtain signed letters from local communities to confirm that the plan you are adopting to solve conflicts have been applied
10. Give a copy of the policy and the relevant documents to a representative of the local government and at least one civil society. Remember to get a signed letter from them stating that they received the policy and relevant documents
11. Obtain from the local community signed letters stating that they have received receipts from you stating that you have received their complains

Criteria 7.15: Preferential employment for local communities

Applicable Standards (7.15.1 – 7.15.2)

Justification: Unskilled manual labor is common on many pangasius farms and, therefore, pangasius aquaculture can be very beneficial to rural village economies as a major source of employment. However, pangasius farmers often resort to hiring migratory workers and asking them to stay on, or close to, the farm. In doing so, the potential value pangasius farming has to local rural economies is lessened. The criteria is formulated to ensure people within the local work force are duly considered for jobs on the farm, and migratory workers are only hired when people within the local workforce do not meet requirements.

Better Management Practices

1. Always try to employ people from local communities rather than people from other areas.
2. Keep records of the name, address and contact number of all people you consulted to advertise the position in the local community (i.e. people living in the district or equivalent administrative unit)
3. You should advertise any openings by posting advertisements around your farm. These advertisement should be dated and, after you employ somebody for that position, you should keep them
4. If you employ anybody which is not from the area where your farm is you should write an explanation for anybody to check why you did not employ a person from the local community.